EXHIBIT 7

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Medical and nonmedical use of prescription pain medication by youth in a Detroit-area public school district

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Abstract

The purpose of this descriptive study was to examine the nonmedical use of prescription pain medications in a sample of public school students in the Detroit metropolitan area. The Web-based survey occurred during a 2-week period in May 2003 and drew on a diverse population between the ages of 10 and 18 years. An 87% response rate was achieved, providing a final sample of 1017. Twenty-two percent of girls and 10% of boys reported lifetime nonmedical use of a pain medication ($\chi^2 = 25.2$, d f. = 1, $p < 0.001$). Of these students who reported lifetime nonmedical use of a pain medication, 15% of girls and 7% of boys reported past year use ($\chi^2 = 12.7$, d.f. = 1, $p < 0.01$). Compared to nonusers, nonmedical users of prescription pain medication were seven times more likely to smoke cigarettes, five times more likely to drink alcohol and smoke marijuana, almost four times more likely to binge drink, and eight times more likely to have used other illicit drugs. Of those reporting lifetime nonmedical use of prescription pain medication, 70% noted who gave them the drugs; 32% reported getting the drugs from a family member, 16% from a friend and 13% from a dealer or theft.

Keywords

Nonmedical use; Diversion; Pain medication; Adolescent drug use; Prescription drugs

1. Introduction

The nonmedical use of prescription drugs in the United States has received relatively scant attention in the research literature despite the current and relatively high prevalence of this form of illicit drug use. Very little data exist on the characteristics associated with the nonmedical use of prescription pain medication among either U.S. middle or high school students (Zacny et al., 2003). This dearth of published data is also apparent in Europe, where there is negligible scientific information on the nonmedical use of prescription pain medications. *ESPAD* (European School Survey Project on Alcohol and Drugs); like its U.S. counterpart *Monitoring the Future*, European researchers have primarily focused on drugs such as cigarettes, alcohol, marijuana, amphetamines, and hallucinogens (see Bjarnason, 2001).

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Thus, to advance our knowledge of the nonmedical use of prescription pain medication among adolescents, this small descriptive study examined the nonmedical use of prescription pain medications in a sample of 5th to 10th graders (10–18 years) residing in one school district in metropolitan Detroit. In this study, the nonmedical use of prescription pain medications refers to the nonprescribed use of a scheduled opiate analgesic (e.g., Vicodin, OxyContin, Tylenol 3 with Codeine).

Our study aimed to answer the following questions: (1) What is the prevalence of medical and nonmedical use of prescription pain medication? (2) Are there group differences in rates of cigarette smoking, binge drinking, marijuana use, and other illicit drug use among lifetime nonusers of prescription pain medications, medical users of prescription pain medications, and nonmedical users of prescription pain medications? (3) Is gender, race, or grade level in school associated with lifetime and past year nonmedical use of prescription pain medication? (4) How do students obtain the pain medication that they use nonmedically?

Among United States secondary school students, the non-medical use of prescription drugs is second only to the illicit use of marijuana (Johnston et al., 2004; Office of Applied Studies, 2002). Between, 1998 and 2000, there were significantly more new U.S. adolescent nonmedical users of prescription pain relievers as compared to adults. Recent studies have shown that nonmedical use of several prescription drugs – including asthma, pain, stimulant, sedative, and sleep medications – represents an increasing problem among adolescents (Johnston et al., 2004, 2003b; Office of Applied Studies, 2002; Boyd et al., 2004; McCabe et al., 2004; Simoni-Wastila et al., 2004). Johnston et al. (2004) found that in 2003, 11% of 12th graders in the U.S. reported the nonmedical use of Vicodin and 5% reported the non-medical use of OxyContin. However, while this and other large studies provide insight into trends in nonmedical use of prescription pain medications, they do not illuminate the motivations for the nonmedical use nor how youth are diverting these medications.

Daniel et al. (2003) were interested in the reasons youth may divert their own prescriptions. Using a mail survey with a sample of 764 girls and 804 boys ranging in age from 9 to 18 years, these researchers posed two questions: (1) “Have you ever shared your prescription medication with others?”; (2) “Have you ever borrowed prescription medication from others?” Approximately 20% of the girls and 13% of the boys reported borrowing and/or sharing prescribed medications in their lifetimes, which is a statistically significant gender difference. Of the girls who reported borrowing and/or sharing prescribed medications in their lifetime, 16% reported borrowing prescription drugs from others and 15% reported sharing their prescriptions. Notably, 7% of these girls between the ages of 15 and 18 years had shared medications more than three times in their lifetime. In a follow-up question that provided fourteen reasons for borrowing or sharing prescription drugs, the respondents were allowed to endorse multiple motivations to share again, there were significant gender differences: 40% of girls and only 27% of the boys said they shared because the person already had a prescription (for the drug) but had run out. Additionally, 33% of the girls and 27% of the boys said they got the drug(s) from a family member. However, there were two motivations that were similar for girls and boys who borrowed or shared drugs: pain relief and sleep aid. Once respondents did not indicate what drugs they borrowed or shared it was difficult to determine whether respondents were talking about acne soap, asthma inhalers, or psychotropic medications such as Ritalin. The ability to determine what kinds of drugs were borrowed and shared is likely important and exposes a limitation of this otherwise useful study.

Pedersen and Lavik (1991) were also interested in the diversion of prescription benzodiazepines. In their sample of 13–19 year olds they found that adolescents identified various sources for their benzodiazepines. Parents were a very significant source. However, it is worth noting that the youth who received the benzodiazepines from their parents reported

that they did NOT use the medication to get high but to self-medicate (presumably for anxiety). Since the non-medical use of prescription pain medications is increasing among U.S. adolescents, there are several issues that deserve further research. For example, more research is needed to explore and better understand differences among sub-groups. Likewise, further inquiry is needed to determine whether the nonmedical use of prescription pain medications is associated with other types of drug abuse. In addition, researchers must devote increased attention to both the diversion activities to procure these prescription medications and the motivations to engage in nonmedical use; improved knowledge regarding the nonmedical use and diversion of prescription drugs will likely lead to evidence-based prevention and intervention efforts.

2. Methods

2.1. Sample

Our sample included 1017 middle and high school students in grades 5–10 from a Detroit-area public school district. Respondents ranged from 10 to 18 years of age, with an average age of 13.7 years. Half of all 7th to 10th grade students in the target population were randomly invited to participate in a different survey, and were not included in the present study. Fifty-four percent of respondents were White, 43% were African American, and 3% were from other racial groups. Gender was equally distributed in the student sample. Approximately 15% of the sample was in 5th grade, 18% in 6th grade, 15% in 7th grade, 18% in 8th grade, 16% in 9th grade, and 19% in 10th grade.

2.2. Data collection

The present study occurred during a 2-week period in May 2003 and drew on a total student population of approximately 1500 students in 5th to 10th grade from one public school district in the Detroit metropolitan area. This public school district was an ideal study site because it provided a diverse sample of students. The school district is located on the northern border of Detroit and includes several communities: a predominantly working-class community (median household income of $ 47,000/year), a more affluent community (median household income of $ 80,000/year) and a relatively poorer community (median household income of $ 22,000/year). Approximately 15% of the students resided in the more affluent community and 40% of the students received free or reduced-price lunches. Fifty-seven percent of the school district's students were white and approximately 40% were black (Standard and Poor's School Evaluation Services, 2003).

The school board gave permission to conduct the survey because it was part of the district's ongoing evaluation of student life. Thus, a letter notifying parents of the up-coming survey was mailed from school administration offices approximately 12 weeks before consent forms were sent home with the students. The survey was also made available to parents (for their review). Parents who did not want their children to participate in the evaluation either returned the consent form to their child's teacher or contacted the school administrative offices. Approximately 0.6% of parents refused to have their student participate.

The survey was conducted over the Internet from computer labs in the students' respective schools. Each “home room” was assigned a day and time to go to the computer lab. When students arrived in the lab, two research assistants greeted them and provided each student with a sheet of paper with a pre-assigned PIN. Students were told to sit at a computer terminal and sign on to the Web-survey by using their unique PIN. The first page of the survey provided a brief description of the study, an informed consent box and basic instructions. Students were told to take the survey “by themselves” and “without talking to their friends”; the research assistants supervised the process and maintained a quiet environment.

The Web-based survey method was used because similar computer-based approaches have been shown to improve the reporting of sensitive information (see McCabe et al., 2002; Turner et al., 1998). The Web survey was maintained on a hosted secure Internet site running under the secure sockets layer (SSL) protocol. Unique PINs were pre-assigned to 1170 students to allow them to confidentially access the Web survey. An 86.9% response rate provided a final sample of 1017. This response rate compares favorably with national school-based alcohol and other drug studies. Reasons for non-response included: absent or dropped out of school (12%), parental refusal (0.6%), and cognitive or reading problems (0.3%). There were no significant differences in parental refusal across different grade levels, nor did parental refusals exceed 1% in any grade. Response rates did not vary significantly by gender, race, or grade level.

2.3. Measures

The survey took approximately 25 min to complete. It included questions about the medical and nonmedical use of prescription pain medication (among other medications) as well as student use of alcohol, cigarettes, marijuana, cocaine, LSD, other psychedelics, inhalants, and ecstasy.

Alcohol, tobacco and drug use was assessed by asking respondents about alcohol and drug use through a series of questions previously used in national studies of 8th, 10th, and 12th grade students (see Johnston et al., 2003a). Measures of lifetime, past year, and past month alcohol and other drug use (e.g., marijuana, cocaine, LSD, other psychedelics, inhalants, ecstasy) were used. Moreover, a gender-sensitive measure of binge drinking was included to measure the frequency of at least one binge drinking episode (i.e., at least four drinks in one sitting for females and at least five drinks in one sitting for males) within the past 2 weeks (Wechsler et al., 1995).

Nonmedical use of prescription pain medications was assessed by measures used in previous research (Boyd et al., 2004; McCabe et al., 2004; Poulin, 2001). Specifically, the following question was posed: “Sometimes people use prescription drugs that were meant for other people, even when their own doctor has not prescribed it for them. Please indicate if you have ever used any of the following drugs not prescribed to you: pain medication (e.g., Vicodin, OxyContin, Tylenol 3 with Codeine)”. The response scale included three possible answers: (1) yes, (2) no, and (3) do not know/rather not say. If respondents indicated lifetime use, they were asked two follow-up questions. One question asked: “On how many occasions have you used the following types of drugs not prescribed to you in the past 12 months? Pain medication (e.g., Vicodin, OxyContin, Tylenol 3 with Codeine)”. The response scale was (a) none, (b) 1–2 occasions, (c) 3–5 occasions, (d) 6–9 occasions, (e) 10–19 occasions, (f) 20–39 occasions, (g) 40 or more occasions, (h) do not know/rather not say. The other follow-up question assessed *obtaining prescription pain medication* not prescribed to an individual. This question asked respondents who reported lifetime nonmedical use of prescription pain medication to “[p]lease indicate how you obtained prescription pain medications NOT prescribed to you by a doctor”. Since very little information is available in this area, an open-ended text box was provided to respondents instead of a response scale.

Medically prescribed use of prescription pain medications was assessed using the following item: “Many people are prescribed drugs by their doctor. Has your doctor ever prescribed the following types of drugs for you? (Pain medications, e.g., Vicodin, OxyContin, and Tylenol 3 with Codeine)”. The response scale was: (1) yes, (2) no, or (3) do not know/rather not say. If respondents indicated they had used pain medication in their lifetime, the following question was asked: “Have you ever been approached to sell, trade or give away your prescription medication (pain medication, e.g., Vicodin, OxyContin and Tylenol 3 with Codeine)?” The response scale was: (1) yes, (2) no, or (3) do not know/rather not say.

Heavy episodic drinking was measured using the following item: "Over the past 2 weeks, on how many occasions have you had five or more (four or more for females) drinks in a row?" A "drink" was defined as a glass of wine, a bottle of beer or wine cooler, or a shot of liquor straight or in a mixed drink. The response scale was (1) none, (2) once, (3) twice, (4) 3–5 times, (5) 6–9 times, (6) 10 or more times, and (7) do not know/rather not say (Wechsler et al., 1995).

Past month alcohol use was measured using the following item: "On how many occasions (if any) have you had alcohol to drink during the past 30 days?" The response scale was (1) none, (2) 1–2 occasions, (3) 3–5 occasions, (4) 6–9 occasions, (5) 10–19 occasions, (6) 20–39 occasions, (7) 40 or more occasions, and (8) do not know/rather not say (Johnston et al., 2003a,b).

Past month cigarette use was measured using the following item: "On average, how many cigarettes did you smoke during the past 30 days?" The response scale was: (1) none, (2) less than one cigarette per day, (3) one to five cigarettes per day, (4) about one-half pack per day, (5) about one pack per day, (6) about one and one-half packs per day, (7) two packs or more per day, and (8) do not know/rather not say (Johnston et al., 2003a,b).

Past month marijuana use was measured using the following item: "Have you ever used marijuana in the past 30 days?" The response scale was the same as for lifetime nonmedical use of prescription pain medication.

Past year other illicit drug use (other than marijuana)-*including LSD, psychedelics other than LSD, cocaine, inhalants, and ecstasy*-was measured with the following question for each drug: "Have you ever used any [name of drug] in the past 12 months?" The response scale for each substance was the same as for lifetime nonmedical use of prescription pain medication. An *Past year other illicit drug use* consisted of any past year use of the following drugs: cocaine, LSD, other psychedelics, inhalants, or ecstasy.

2.4. Data analyses

Data analyses included 1017 student respondents and all statistical analyses were carried out using SPSS 11.0. To determine the prevalence of medical use and nonmedical use of prescription pain medication, the number of students reporting each of these behaviors was divided by the total number of students. Chi-square tests were used to compare the prevalence of medical use, nonmedical use,and diversion of pain medication across several demographic variables (e.g., gender, race, and grade level). We used a design-based weight throughout this analysis to correct for the different probability of selection in earlier versus later grades, and to insure that our results were representative. The general approach to developing analysis weights is to take the inverse of the selection probabilities.

Logistic regression models were used to examine binary substance use measures across four distinct groups of lifetime prescription medication use: (1) respondents who did not use prescription medication (nonusers), (2) respondents who used prescription medication as prescribed by their doctor (medical use only), (3) respondents who used both prescription medication as prescribed by their doctor and prescription medication that was not prescribed to them (both medical and nonmedical use), and (4) respondents who used prescription medication that was not prescribed to them (nonmedical use only). Logistic regression analyses were also conducted to model the influence of possible covariates on the probability of nonmedical use of prescription pain medication among student respondents. Characteristics significantly associated with either lifetime or past year nonmedical use of prescription pain medication according to the bivariate results ($p < 0.01$) were included in the final regression

models. Odds ratios were adjusted for gender, race, grade level, and lifetime medical use of pain medication, and 95% confidence intervals (CI) were reported.

In addition, a content analysis was performed on open-ended responses to how students obtained prescription pain medication not prescribed to them. After reading all of the open-ended textual responses provided by students who reported the nonmedical use of prescription pain medication in their lifetimes, the first author identified three distinct categories of sources: family members, friends, and other. After creating the categories, the first author proceeded to code the students' responses and place the responses within the three mutually exclusive categories. After completing the initial coding, all of the textual responses were given to the second and third authors with instructions to independently code the textual responses using the three categories identified by the first author. Inter-coder agreement was defined as the number of responses agreed upon by the three authors divided by the total number of open-ended responses assessed. Inter-coder agreement was calculated after all three authors completed their coding of the textual data. Inter-coder agreement was determined by randomly selecting 30 of the 93 open-ended responses and comparing the authors' coding of these responses. Agreement between any two of the three authors was excellent with agreement in at least 28 of 30 cases, and Cohen's kappa values were above 0.95.

3. Results

One hundred and thirty-four students reported lifetime nonmedical use of prescription pain medication (e.g., Vicodin, OxyContin, etc.). There were significant gender differences in the reporting of both medical and nonmedical use of prescription pain medication. For example, 22% of girls and 10% of boys reported lifetime nonmedical use of a pain medication ($\chi^2 = 25.2$, d f. = 1, $p < 0.001$). Similarly, 15% of girls and 7% of boys reported annual use in the past year ($\chi^2 = 12.7$, d f. = 1, $p < 0.01$). There were no differences between White and African American students in their reports of medical or nonmedical use of prescription pain medication. In general, as grade level increased so too did prevalence rates of substance use, including both medical and nonmedical use of pain medications For instance, only 4% of 5th graders engaged in the nonmedical use of pain medication during the previous year as contrasted with 9% of 8th graders and 22% of 10th graders (see Table 1).

When we compared groups of respondents based on their medical and nonmedical use of prescription pain medications we found some interesting differences relative to cigarette smoking, alcohol use, marijuana use, and other illicit drug use. For instance, when analyzing the four mutually exclusive groups of respondents (i.e.,nonusers, medical only users, medical and nonmedical users, and nonmedical only users) we found that compared to nonusers, nonmedical only users were seven times more likely to smoke cigarettes, five times more likely to drink alcohol and smoke marijuana, almost four times more likely to binge drink, and eight times more likely to have used several other drugs (see Table 2). Respondents who reported both medical and nonmedical pain medication use were also more likely, when compared to nonusers, to use cigarettes, alcohol, marijuana, and other illicit drugs. Students who only used pain medication as prescribed were significantly more likely than nonusers to use cigarettes and marijuana but no more likely to use alcohol or other illicit drugs.

Using logistic regression analyses, we examined the relationship between nonmedical use of prescription pain medication and several potential correlates including gender, race, grade level, and the medical (prescribed) use of pain medication. After adjusting for all of these factors, we found that girls were two times more likely than boys to report nonmedical use of pain medications in their lifetimes (OR = 2.0, $^{p} < 0.01$), although they were not more likely to have used during the past year. There were no statistical differences between Whites and African Americans relative to lifetime or past year nonmedical pain medication use. However,

there were differences among grade levels (see Table 3). After controlling for other factors (e.g., gender, race, etc.) we observed an eight-fold increase (OR = 8.1, $p < 0.001$) in lifetime nonmedical use and a 10-fold increase (OR = 9.8, $p < 0.001$) in past year nonmedical use among students who had either current or previous prescriptions for pain medication (see Table 3).

Of the 131 students reporting lifetime nonmedical use of prescription pain medication, 93 (70%) provided a response to our open-ended question regarding how they obtained the drugs while 41 (31%) chose to check a box that corresponded to “do not know/rather not say”. Of the 93 students who provided responses, 32 reported getting the drugs from family members. Responses included, “from my mom”, “from my parent”, “they were my sisters and my mother is a nurse”, and “friends, parents, and people I do not know”. When providing a reason for why they got it from a family member, this group reported getting these medications because they had migraine headaches, menstrual cramps, etc. Sixteen students reported getting the drugs from friends. Reponses typical of this group included: “from a friend” and “a friend of mine had broken his arm and gave me some of his pain medication”. Thirteen students reported getting the drugs from dealers, people, or taking/stealing them from home or medicine cabinets. Comments from respondents in this category included: “I am a stealer and I like robbing places”, “pain pills (from) medicine cabinet@home”, “I went to a kid who was in the bathroom and he said do you want something good and I said yes so he gave me two pills for $ 5”, “from people who have the drug”, and “a dealer”. It is worth noting that approximately four students gave multiple sources (e.g., mother and friends). Unfortunately, almost half of the students who responded to the open-ended questions provided a variety of responses that were difficult to interpret, such as “taken with water and food” and “I hurt my leg”. We did not code these responses because they did not provide a reasonable response to the question about obtaining the prescription medication. Of interest was that no student reported getting prescription drugs on the Internet. In terms of race, gender, or grade-level, there were no statistical differences in the likelihood of providing an open-ended response.

4. Discussion

In the current study, we discovered that approximately 16% of students had engaged in the nonmedical use of prescription pain medication during their lifetimes and 11% of students did so in the past year. Our prevalence rates were considerably higher than the *Monitoring the Future* data from the same year (Johnston et al., 2004) and unlike the *Monitoring the Future*, we found that girls in our study reported higher rates of nonmedical use of prescription pain medication than boys. However, the differences between the two studies could be attributed to differences in question wording, data collection modality, and study population; computer-based approaches to data collection have been shown to produce higher estimates of drug use (Turner et al.,1998).

Our data also differed in terms of racial differences. Nationally representative samples of middle and high school students reveal racial differences in the nonmedical use of prescription drugs with white students typically reporting greater use than African American or Hispanic youth (Johnston et al.,2004). In the present study we used a school district that is well-integrated and this may account for their being no racial differences in students' reports of nonmedical use of prescription pain medication. However, rates did differ by grade level; the higher the grade level, the more likely the older student was to report nonmedical use of prescription pain medication. The correlation between grade level and the nonmedical use of prescription pain medication may be related to age (having lived longer) or younger students being less likely to carry and/or self-administer their own medications. It appears that the increase in nonmedical use paralleled an increase in medical use of prescription drugs.

Overall, the present study's prevalence rates of alcohol and other drug use were similar to national findings of high school students (Johnston et al., 2004). Students in our sample who nonmedically used prescription pain medication were more likely to smoke marijuana and cigarettes; in fact, the nonmedical use of prescription pain medication was significantly associated with high rates of all forms of drug use. These findings suggest the possibility that nonmedical use of pain medication represents part of a cluster of risky behaviors that include cigarette smoking, binge drinking, marijuana use, and other illicit drug use (Jessor et al., 1991).

Although the nonmedical use of prescription pain medication may represent significant problem behavior, asking for another's pain medication could be a form a self-medication. There is some evidence that girls, particularly between the ages of 9 and 18 years, are willing to share commonly prescribed medications (Daniel et al., 2003) including pain medications. It is certainly plausible that students experiencing menstrual cramps, headaches, or other types of pain, may “borrow” friends' prescription medications to relieve the pain. While our data provide some preliminary insights into this issue, all of these hypothesized motivations need to be further explored. Nevertheless, it should also be emphasized that using prescription pain medication for a purpose other than that intended by the prescribing clinician is risky health behavior and should be prevented.

It is apparent that children and adolescents who are prescribed pain medication are also more likely to report nonmedical use of pain medications. Students who had been prescribed pain medications were 10 times more likely to report the nonmedical use of prescription pain medications. It may also be important for clinicians to better treat the pain children experience (e.g., migraines and menstrual cramps) so that children are not tempted to self-medicate. The students' responses to our open-ended question provided preliminary evidence that parents sometimes provide prescription medication to their children in an effort to relieve the child's discomfort. Thus, the motivation for diversion in many cases may involve family and friends trying to “help” and not trying to get the child “high”.

The results of the present study also have important implications regarding the management and prevention of abuse of prescription pain medication in households and schools. The two leading sources for nonmedical pain medication were family and friends. Family members and students need to be educated about the potential dangers associated with providing abusable prescription pain medications to their children and peers. In particular, students who receive prescription pain medication from nonclinical sources are unlikely to receive the appropriate information about possible contraindications or negative interactions with other licit or illicit drugs. In addition, there is a need to educate family members regarding the degree to which prescription pain medications could be available to adolescents in their households. Based on our qualitative responses from students, there was some indication that prescription pain medications were stolen from homes and medicine cabinets. This suggests the importance of storing abusable prescription drugs in safe locations that cannot be easily accessed. Finally, schools can play an important role in deterring the availability of prescription medications for nonmedical use and diversion by implementing effective management policies, especially regarding the storage and dispensation of these medications to students. In the present study, the school district required that if students in 5th to 8th grade needed medication during school hours, it had to be kept in the principal's office and dispensed by school staff. In contrast, high school students (grades 9–12) were allowed to carry their own medication and take it (on their own) during school hours. This practice may have contributed to the higher nonmedical use and diversion rates found in higher grade levels.

While the findings from this descriptive study are timely and warrant further research attention, our conclusions are constrained by several factors. For example, although the sample was

racially diverse and large enough to provide preliminary insights into the extent of the nonmedical use of prescription pain medication, the sample was drawn from one school district. Therefore, generalizations to other populations are limited. Prevalence rates among students in 5th to 10th grade in other school districts may be different. Future research is needed to examine whether the findings from this study generalize to other school districts in the U.S. and student populations in other countries. International work is particularly important as it is not known whether documented increases in medical use of opioid analgesics in the U.S. and other developed countries correlates with increases in nonmedical use of these medications (Berbatis et al., 2000; Joranson et al., 2000; Zacny et al., 2003).

Another limitation of, this cross-sectional study is that it relied on self-reports of students in school and did not gather data from students who were absent on the day of the survey administration, or had dropped out of school. This may have resulted in under estimates since previous research has shown that students who are absent or drop out of school tend to report higher rates of drug use (Johnston and O'Malley, 1985).

An additional limitation of this study is that it represents an analysis of survey data collected for a larger evaluation study and thus, the items in the original questionnaire present some limitations. For instance, we never assessed the quantity and frequency of the prescribed use of pain medication. We also did not collect information regarding the specific individual drugs (e.g., Vicodin, OxyContin, etc.) that were used – either medically or nonmedically – nor did we ask about route of administration (e.g., IV, inhalation, etc.). Future studies would be well advised to include items on quantity, frequency, and route of administration in their questionnaires. We also recognize that the present study would have benefited from collecting self-reported diagnoses that provided medical indications for prescription pain medication (e.g., sickle cell anemia).

Finally, we had some difficulties interpreting information regarding the source of prescription pain medication. Future investigations might wish to avoid open-ended questions on this topic, at least among adolescents and young students. It is our hope that the responses discussed here will inform the creation of useful response categories for future research.

There is ample evidence that the nonmedical use of pain medications is on the rise in the U.S. and this increase coincides with the increase in retail sales and prescriptions dispensed for opioid medications such as fentanyl, oxycodone, hydrocodone, hydromorphone, and morphine (Joranson et al., 2000; Zacny et al., 2003). Despite the increases in nonmedical use, prescription pain medications remain a highly effective and safe medication for the majority of youth suffering from acute and chronic pain (Howard, 2003). In this study, we found that most of the students who were prescribed pain medications in their lifetime never reported nonmedical use. However, 36% (n = 94) of the 262 students who had prescriptions for pain medications also reported using pain medications nonmedically. Although the nonmedical use of prescription pain medication among youth in the U.S. represents a problem, it is imperative to strike a balance between pain management and the availability of abusable drugs (Howard, 2003; Joranson et al., 2000; Simoni-Wastila and Tompkins, 2001). If the clinical community is to combat the nonmedical use of prescription pain medications, further research is needed to identify populations most at risk for this form of drug use. We must understand the nature of this drug problem so as to develop adequate prevention programs while not deterring the treatment of pain in children.

Uncited references

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Table 1

Demographic characteristics and prevalence of medical and nonmedical use of prescription pain medication

	Total student sample, n^a	Lifetime nonmedical prescription pain medication use (n = 963), % (95% CI)^b	Past year nonmedical prescription pain medication use (n = 953), % (95% CI)^b	Lifetime prescription pain medication use (medical use) (n = 957), % (95% CI)^b	Diversion of prescription pain medication^c (n = 280), % (95% CI)^b
Overall	1017	15.9 (13.6–8.2) ***	11.0 (9.0–13.0) ***	29.8 (26.9–32.7) ***	23.6 (18.6–28.6) *
Gender					
Female	506	21.7 (18.0–25.4)	14.6 (11.4–17.8)	37.1 (32.8–41.4)	19.0 (13.2–24.8)
Male	511	9.9 (7.2–12.6)	7.4 (5.0–9.8)	22.5 (18.7–26.3)	31 1 (22.3–39.9)
Race					
White	545	15.9 (12.7–19.1)	11.6 (8.8–14.4)	26.9 (25.6–33.6)	25 9 (18.8–33.0)
Black	442	15.3 (11.8–18.8)	10.1 (7.2–13.0)	30.5 (26.1–34.9)	21.4 (14.2–28.6)
Other	30	23.3 (8.2–38.4) ***	14.3 (1.3–27 3) ***	22.6 (7.9–37.3) ***	16.7 (13.1–46.5) **
Grade level					
5th grade	228	6.4 (2.3–10.5)	3.6 (0.5–6.7)	22.5 (15.5–29.5)	12 9 (1.1–24.7)
6th grade	272	8.9 (4.6–13.2)	4.7 (1.5–7.9)	20.5 (14.4–26.6)	11.4 (0.9–21.9)
7th grade	112	12.6 (7.0–18.2)	6.7 (2.5–10 9)	17.8 (11.3–24.3)	17.4 (1.9–32.9)
8th grade	138	16.0 (7.7–17.5)	9.1 (4.8–13.4)	30.1 (23.3–36.9)	15 1 (5.5–24.7)
9th grade	122	21.3 (14.9–27.7)	16.6 (10.7–22.5)	39.7 (31.9–47.5)	35 1 (22.7–47.5)
10th grade	145	26.6 (20.3–32.9)	22.4 (18.2–30.6)	44.6 (37.4–51.8)	32 5 (22.4–42.6)

[a] Based on unweighted data.

[b] Based on weighted data.

[c] Diversion is defined as those lifetime medical prescription pain users who had been approached to sell, trade or give away their prescription pain medication.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

Table 2

Substance use by medical and nonmedical use of prescription medication

	Past month cigarette smoking (*n* = 909)		Past month alcohol use (*n* = 914)		Past 2 weeks binge drinking[a] (*n* = 903)		Past month marijuana use (*n* = 914)		Past year other illicit drug use[b] (*n* = 932)	
	%	OR (95% CI)[c]	%	OR (95% CI)[c]	%	OR (95% CI)[c]	%	OR (95% CI)[c]	%	OR (95% CI)[c]
Lifetime prescription pain medication status										
Nonuse (*n* = 637)	5 3	1.0	14.6	1.0	5.4	1.0	4.0	1.0	2.3	1.0
Prescribed use only (*n* = 171)	13 5	2.2 (1.2–4.0)**	22.5	1.3 (0.8–2 1)	10.2	1.6 (0.8–2.9)	12.4	2.6 (1.3–5.0)	3.4	1.5 (0.6–4.0)
Prescribed and nonmedical use (*n* = 99)	17 2	2.4 (1.2–4.7)**	37.6	2.3 (1.4–3.8)**	20.0	3.0 (1.6–5.8)**	26.5	5.6 (2.9–10.8)***	15.0	7.2 (3 2–16.0)***
Nonmedical use only (*n* = 40)	32 5	7.1 (3.2–15.8)***	50.0	5.4 (2.6–11.1)***	21.1	3.5 (1.4–8.7)**	23.1	6.5 (2.4–17.2)***	17.9	8.6 (3 1–24.0)***

Note: Rates for drug use were as follows: monthly smoking (9.6%), monthly drinking (20.1%), binge drinking (8.8%), monthly marijuana (8.8%), and past year illicit drug use (5.5%). Nonusers served as reference group.

[a] At least one binge drinking episode (i.e., at least four drinks in a row for females and at least five drinks in a row for males) within the past 2 weeks (Wechsler et al., 1995).

[b] Past year other illicit drug use consisted of any use of cocaine, LSD, other psychedelics, inhalants or ecstasy.

[c] Odds ratios are adjusted for all other covariates in the model and the reference group for each model was students who did not report medical or nonmedical use prescription pain medication in their lifetime. All of the models also included gender, race, and grade level. The odds ratios for these variables were not shown.

** $p < 0.01$.

*** $p < 0.001$.

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Table 3

Logistic regression for nonmedical use of prescription pain medication, adjusted odd ratios

	Lifetime nonmedical pain medication use (*n* = 936)		Past year nonmedical pain medication use (*n* = 929)	
	Adjusted OR	**95% CI**	**Adjusted OR**	**95% CI**
Gender				
Male	1.00	Reference	1.00	Reference
Female	1.98**	1.31–2 99	1.46	0.91–2.36
Race				
White	1.00	Reference	1.00	Reference
African American	0.92	0.61–1 38	0.81	0.51–1.30
Other	2.05	0.72–5.78	1.45	0.42–5.07
Grade level				
5th grade	1.00	Reference	1.00	Reference
6th grade	1.45	0.59–3 54	1.29	0.40–4.12
7th grade	2.33	0.94–5.77	2.43	0.77–7.66
8th grade	2.22	0.97–5.09	2.06	0.72–5.90
9th grade	2.56*	1.12–5.83	3.43*	1.24–9.47
10th grade	3.30**	1.50–7 28	4.85**	1.83–12.90
Lifetime medical use of pain medication				
No	1.00	Reference	1.00	Reference
Yes	8.05***	5.32–12.18	9.80***	5.86–16.39

Note: Odds ratios were adjusted for gender, race, grade level and lifetime medical use of pain medication.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.